TOOL • DIE • MACHINE

PROGRESS

Official Publication of SPECIAL TOOL, DIE and MACHINE SHOP INDUSTRY

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MACHINE SHOP PRACTICE

•

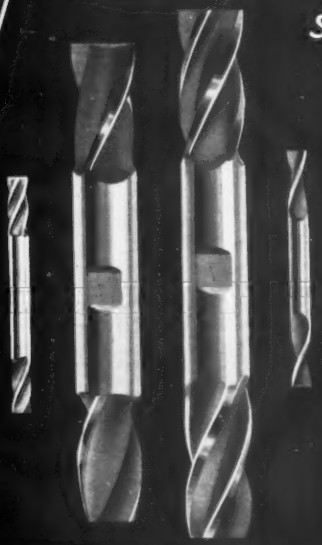
PRODUCTION

June, 1936

Vol. 2, No. 4

There IS a Difference!

WEL-DON DOUBLE-END END-MILLS offer DEFINITE SUPERIORITIES



LESS BREAKAGE

Accurately Machined Teeth
Assuring a stronger mill, with longer life.

Uniform Hardness
Automatically-controlled furnaces assure pre-determined results.

True Running
Shanks, ground to closest tolerances, accurately fit Wel-Don holders.

That's The Difference

THE WELDON TOOL CO.
321 FRANKFORT AVE.
CLEVELAND, OHIO

"Pioneers in FAST SPIRAL DOUBLE-END END-MILLS"

GRINDRITE

The grinder designed by a die-maker and developed in a die shop especially for the severe requirements of manufacturers of tools, dies, special machinery, automobile bodies and parts, as well as all products requiring heavy grinding or filing.

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Grind Down Your Costs 50%

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HEAVY-DUTY MODEL

Fully equipped, ready for immediate use

An exceptionally sturdy, durable tool . . . Particularly effective for grinding unusually difficult shapes and contours.

GRINDRITE JR. is the portable bench-type.

Write for descriptive circular and list of prominent GRINDRITE users.

KOESTLIN TOOL & DIE CORP.

3605 Humboldt Ave. Manufacturers of Sheet Metal Dies **Detroit, Michigan**

Please mention TDM PROGRESS when writing advertisers.

*He Measures In Millionths**

By James Sweinhart

With permission of Ford Motor Company, Johansson Gage Block Division.

A COMMON ruler is a simple thing. Graduated in inches or centimeters one can be bought for a nickel. Sometimes they are given away as souvenirs. And yet on MEASUREMENT, the science of which they are an expression, is founded the whole Progress of Man! . . . . .

A common house-fly alights on my table. I HEAR nothing. All humans about the room testify that there has been no noise. But in a great Eastern laboratory the tread of a house-fly has been amplified until it sounds like a hoofbeat. Were there no noise at all, there would be nothing to amplify. The noise is there but the human ear cannot HEAR it.

Night falls. Our faces are upturned in wonder at the sky. We know a few of those starry lanterns there and point them out. Between them, all seems dark, empty. But look through a telescope! There, between two favorite stars where all seemed dark, a thousand flares are burning. There they have shone for ages unknown to humankind. Man's eye could not perceive them.

Or, looking down,—upon my desk lie a bit of polished granite and a square of polished steel. The fingers like to feel their exquisite smoothness. Dead matter! But put them under a microscopic lens of great power! The surfaces now are seen as rough as a rubber-sponge. And something there is moving, writhing, twisting. Life is ,there, but the human eye cannot SEE it, nor human touch sense it.

Again! Here upon my finger is a bit of talcum. I cannot feel it. From it I get no sense of weight. But scales exist which will show precisely that the tiny speck of talcum weighs four 200,000ths of a grain. In the particle are mass and form and weight. But the human touch cannot detect them. . . . . .

Conscious of the inadequacy of his physical senses, but whipped on by his desire to learn to the uttermost, Man has again and again devised means outside his physical self to help him in his approach to Nature —the sound, to measure the deep; the plumb, to attain a straight line; the prism and lens, to guide light; the square, the angle and the triangle to measure the circumference and area of many-sided objects; the telescope, to measure the heavens; the microscope, to watch the minute operations of Nature in her smaller forms of life, and a host of other devices and instruments. But always, eventually, their limit of use was reached. Always came a question of extension or refinement. Always, confronting, arose the inescapable problem of smaller and more accurate measurement. In many different branches of his explorations and investigations there came into being an unwritten but undeviating law that Man's knowledge advances to the degree that he can measure precisely.

Through the long lapse of the centuries of which we have record, with what passionate zeal and courage has Man applied himself to KNOW Nature! . . . . .

Thirty centuries before Christ the Egyptians were building the Great Pyramid of Gizeh, with a structural and astronomical knowledge that makes the modern world marvel. Twenty-five hundred years later, with the Christian Era still five hundred years off, Pythagoras, a Greek, had caught the idea that the Earth is round and rotates. For his pains his fellows burned his house and drove him into exile.

He is the first scientist, in the modern sense, of which History has record. He first dealt with geometric forms and studied the use of the angle. Even in those far-gone days he emphasized to those who would listen the supreme importance of accurate measurements. He, so early, had already known the bitterness of being able to sense the next step in his investigation, but unable to make it, and prove it, because his powers of measurement were too crude.

After Pythagoras came others who, in thought or deed, stamped themselves upon their times. Euclid took Pythagoras'

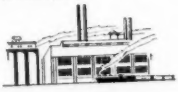
*Somewhat abridged.

knowledge of the angle and, with it, first investigated space, laid the foundation for geometry and mathematics, investigated the heavens. Two hundred and fifty years before Christ he studied force at work without motion (static) and gave the world the laws of the lever and pulley, developing any desired power. From studying the inclined plane he evolved the "Archemedes Screw," a vital part of the mechanism of the soya bean oil extractor which has been developed at the Edison Institute of Technology at Dearborn, Michigan.

Soon after Archemedes, Hipparchus took Pythagoras' angle and Euclid's mathematics and computed the distance of the Sun and Moon, laying the foundation for celestial measurements to come centuries later. In Hipparchus' time cultural civilization was already decadent. Rome soon went crashing down, bringing an era of world confusion. Science was forgotten. Then, after 1500 years, men began to be interested in the arts, in literature. Soon science had a new birth—and there emerged one of the great intellectual mile-posts on man's long journey—Copernicus.

Reaching back to the already ancient calculations of Hipparchus, Copernicus went on and proved that the Earth rotates once daily on its own axis and moves, yearly, around the Sun. He gave mankind its first glimpse of the infinity of the universe. For which colossal contribution to human knowledge the powers of his time burned him at the stake.

But Gallileo, 50 years later, began where Copernicus left off and went vastly further. From this mind spring many different branches of modern science. He took lenses, in use for reading for more than 300 years, fitted them together in a tube and invented the telescope. With it he watched the heavens and announced that this Earth is but one of many worlds—for which statement he was in danger of the rack till the day he died. He invented the microscope, laid the basis for modern physics, mechanics, acoustics and the theory of heat. He first conceived air pressure and was first to investigate the tensile strength of many materials. Soon thereafter came Kepler, proving Copernicus' theory, laying the foundation for Newton's discovery of gravity; Pascal, who proved the pressure of air which Gallileo sensed and Snell who, going farther with Hipparchus' angle and Euclid's mathematics laid the foundation for all modern surveying and first measured the refraction of light. So it went on through the centuries, each searcher mounting higher on the work of another, each creating a new epoch in human knowledge—and, oftimes, succeeding only to that degree that he was able to refine his measurements.



Finally history gives us the name of James Watt. He literally changed the face of the earth—for he, applying principles which he got from others before him, invented the steam-engine, gave the world steam-power, laid the basis for large scale mechanical manufacture. Before him some of the world's work was done by water-power or power applied by the horse, the ox or the camel—but the vast bulk of the world's manufacturing was done by hand, in the home. But, with Watt, came the factory. Great industrial centers began to evolve. A tide started moving from the farm to the cities, and the land, stripped of manufacture, was left to agriculture. Man had taken his first step toward modern mass production. Then, as never before, arose the need of accurate measurements. Mechanical manufacture, steam-driven, in a thousand different forms was evolving. In a new and stupendous way mankind was confronted by need of accurate measurements in many varied forms.

Every advancement of science creates a new need. In filling the new need, man finds a wider field for his employment. With the great populous centers and quickened tempo of life brought by steam power there came a new need for quicker, better transportation, faster communication. Lo, Nature had already prepared the way. For, along with their studies of force, static and in motion, astronomy and chemistry, Scientists had been passionately trying to grasp the nature, meaning and use, first of magnetism and then of electricity. Galvani, Volta, Ampere, LaPlace—a long list of earnest searchers had accumulated a vast store of knowledge. The world now saw the evolution of the steamship, the railroad, the telegraph, the cable, the telephone.

And in the sky of science looms that

(Continued on page 15)

Should Tool, Die and Machine Shops Be Graded According to Quality of Products?

RECENTLY, at a meeting of Industry executives, the question was asked: "Are there not widely varying grades or qualities of tool, die and machine work?"

The answer probably should be "NO". This, however, would emphatically declare that all tool and die work done in all shops, contract or "captive," is perfect —A-1 grade.

Now, every buyer and user knows that this is far from possible. The human element enters into the manufacture of these highly specialized tools and dies as it does into every other activity. There are good tool and die-makers, mediocre ones and poor ones, careful machine hands and careless ones. There are supervision and inspection which are most meticulous and there is also the shop where these essentials do not rate as high. And this is true not only of the contract or job shop but likewise of the tool and die room owned and operated as an integral part of a production plant.

It is an accepted fact, of course, that there must be a much higher degree of accuracy or precision in the manufacture of tools, dies and machines which are intended to fabricate unusually accurate parts and products. This may extend even to the necessity for temperature control. This article, however, is not concerned with that super-accurate type of work, but rather with the general line of special tools, dies, jigs, fixtures, molds, gages and machines which are required by most industries in the production of their products. Here there would seem to be justification for answering the question first asked:

"Yes, there are several grades of tool, die and special machine manufacture."

It would not be wholly accurate to say that these grades or qualities of work are predicated upon the amount of deviation the finished products may show from blueprints and designs. In fact, generally there cannot be much of a lapse from the so-called accurate dimensions shown. In some instances, however, tolerances are more liberal and this can be a factor in cost estimating and pricing. The closer the tolerance the more careful must be the workmanship, and naturally the longer the time required and the more costly the job. When such accurate work is required there should be no doubt as to the contract shop estimator understanding it. To permit it to be otherwise jeopardizes the quality of the tool, as well as its time of delivery.

While it may not be possible to divide tool, die and machine contract shops into separate and distinct groups, it is undisputed that different shops are equipped to do not only different *kinds* of work but are also qualified to do different *grades* and *qualities*. Briefly, there is the shop which specializes in such highly accurate products as lamination dies. At the other extreme is the shop which makes large drawing and stamping dies, some big enough to turn out half of an automobile body.

In each classification there may be different qualities of work. No user of special tools and dies, making them in his own shop, expects them to be of the first quality if he employs mediocre or poor workmen or does not use steels and parts which have been tested and proven. By the same token, no careful buyer experiments when he selects contract shops to turn out his tools and dies.

He selects contract shops which are qualified by experience to make the particular tools or dies or machines he needs, shops which have proven managements and which are known to employ as highly skilled workers as are obtainable to turn out work of the degree of accuracy which he requires. After all, every manufacturer recognizes that there are in every trade, workers of varying qualifications, skill and fitness for the work they do.

No astute buyer of tools, dies, special machines and all of the other products of the TDM Industry, expects a shop which is equipped for and specializing in large automobile body dies to turn out with the same workmen a super-accurate lamination die—or vice versa. By the same token, an astute buyer classifies into two or three grades, shops which make each of these products. Different blueprints for various tools required by the same buyer may specify different degrees of tolerance, dependent upon the use which

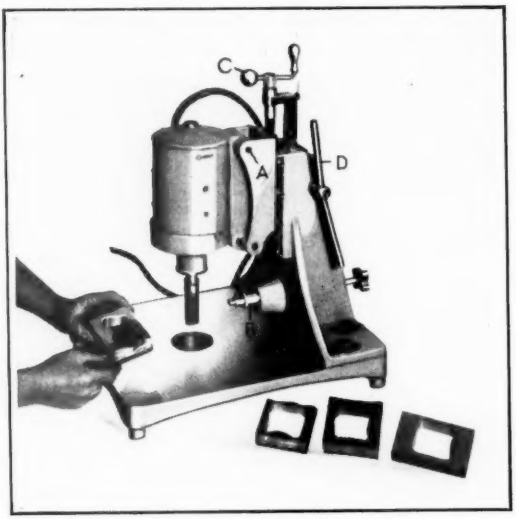
(Continued on page 10)

NEW AND INTERESTING PRODUCTS

Developed for Heavy-duty Grinding Service

GRINDRITE Grinders were developed by a die maker for the exceptionally heavy-duty service required in the manufacture of automotive body dies and similar large drawing and stamping dies and fixtures.

Automobile manufacturers themselves, as well as the makers of passenger car and truck bodies, frames and axles, refrigerators and other electrical equipment, machine tools, special machinery and heavy stampings — abroad as well as in the United States —learning of GRINDRITE'S adaptability to their requirements, installed both the Heavy Duty model and the Junior.



The former comes fully equipped with a one horse power electric motor, which develops a speed of 1750 R.P.M. with full load, one grinding wheel with 8″ diameter and 3½″ face, one diamond dressing attachment and diamond.

GRINDRITE, JR. is a portable, bench type, with ½ horse power electric motor of universal type, capable of developing 7500 R.P.M. at full load with largest size grinding wheel, 12,500 R.P.M. running idle. Interchangeable grinding wheels and pencil sticks can be used on this grinder. Regular equipment consists of one wheel 2½″ diameter and 1¾″ face and three stick wheels, each 2″ long and of 1″, ¾″ and ½″ diameter. The motor is supported on a pivot about which it may be swung five degrees in either direction to grind the required clearance in dies. A graduated scale facilitates accurate angle settings. A diamond dresser adjustable by means of a hand screw is provided for resurfacing the wheels. There is also a quick toggle action mechanism operated by a lever used for lifting the wheel clear of the work when inspection is desired. Extra wheels and pencil sticks can be procured at nominal cost. These are mounted in standard size uniform adaptors.

GRINDRITE Grinders are a product of the Koestlin Tool & Die Corporation, 3605 Humboldt Ave., Detroit, Mich.

Thrilling Speeds! Amazing Power!

100,000 revolutions per minute, but weighing only 8½ ounces! M-B Products, 128 East Larned Street, Detroit, Michigan, would seem to be justified in claiming that their Super-Speed Air-Grinder performs in a revolutionary manner.

Where the skilled workman needs a combination of precision, speed and efficiency, this unusually compact formed-to-fit-the-hand Air-Grinder is said to do excellent work. Using genuine Norma Hoffman Bearings, protected by a filter in the air hose line, long life should be assured working parts. It is a tool to use in the difficult, hard-to-get-at places.

Please mention TDM PROGRESS when writing advertisers.

Are Cemented Carbide Tools Profitable for Job Shops?

By Jack L. Lyons, M. E.
Lyons Machine Company, Cleveland, O.

MANY job shop executives feel that the hard cutting alloys can only be used effectively on production work. This is probably due to the fact that all makers of Cement Carbides are naturally concentrating on Production problems.

Did you ever stop to think that a JOB SHOP MACHINE TOOL removes more actual metal in a year than many production machines?

It is imperative that a job shop machine be made to cut as fast and efficiently as possible to compensate for set-up and other wasted time.

Minutes and hours are precious in the tool industry where every job is pushed to the limit for quick delivery.

Tungsten Carbide tools properly placed in a shop will save hours, and on larger jobs even days. An hour saved at the start of a job increases in value as the dreaded delivery date approaches.

In one shop four castings were being machined. They were of irregular shape and very difficult to mould, consequently a bad casting was the result. There were several thin sections which had chilled, other parts had warped and left excessive finish. This job was a real shop headache. A previous lot of four had been machined in 32 hours. *Firthite* Sintered Carbide was put to work and the time was cut in half with better finish and closer accuracy.

Do not consider the original cost of these tools—they pay for themselves very quickly. In many cases the first job will pay for the tool. In the instance mentioned above the actual saving in labor paid for the tool.

Using the best cutting tools you can buy on your machine tools is not only common sense but oftentimes the method of making profit where loss seems inevitable.

Firthite Sintered Carbide has been developed to the point where it can be used to excellent advantage by job shops. There are plenty of chilled iron, alloy iron, welded castings which have chilled around the weld, tough bronze and like materials which can be machined with extremely profitable results.

There is no doubt that Tungsten Carbide will give the job shop operator machining hours when he needs them most, therefore a good rule to follow is —use Tungsten Carbide whenever possible!

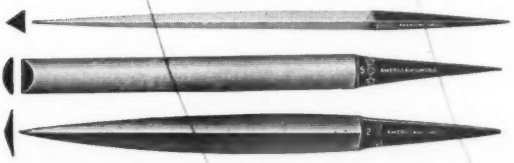
DAY BY DAY—

"Day by day, in every way, PROGRESS gets better and better. The articles are good, the advertisements are interesting, and the general appearance improves with each issue.

"Keep up the good work. . . ."

HARLEY L. FREEMAN, *President*
The Industrial Machine Co.,
Cleveland, Ohio.

AMERICAN SWISS PATTERN FILES
are the only type of files we manufacture.
Over 2000 Regular Shapes, Cuts and Sizes



TOOL & DIE MAKERS USE AMERICAN SWISS FILES.
AMERICAN SWISS FILE & TOOL CO.

Distributed by

THE WHITE TOOL & SUPPLY COMPANY
1317 WEST 6th ST. MAin 0235 CLEVELAND, OHIO

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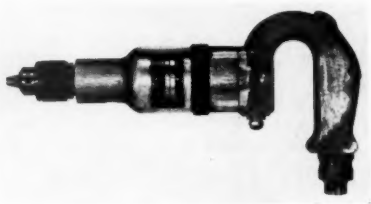
NEW AND INTERESTING PRODUCTS

Reduces Drill Breakage

ONE of the principal factors in economy of operation of a portable drill lies in minimum breakage of the drills. Just this is claimed for the new Hercules Model No. 016-4, which has been especially designed for use in the fabrication of automotive bodies, airplanes, refrigerator cabinets and similar work. This model is small—12" over all, and lightweight 4½ lbs. The air motor itself is built on the original Hercules rotary lock principle and is controlled by thumb throttle. The motor operates the chuck spindle direct through planetary gears and the tool is ball-bearing throughout.



It is a product of the Buckeye Portable Tool Co. of Dayton, O.

The CONTINENTAL DO-ALL (Dual)

A 3 IN ONE NECESSITY

BAND POLISHING

NARROW BLADE - PRECISION BAND SAWING

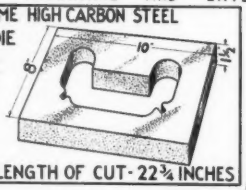
BAND FILING

INTERNAL AND EXTERNAL

HIGH CHROME HIGH CARBON STEEL LAMINATION DIE

SAWING TIME 1½ HOURS

FILING TIME 2 HOURS



LENGTH OF CUT - 22¾ INCHES

INSTANTLY CHANGE TO ANY FUNCTION

"BUILT-IN"

- Automatic electric saw brazing unit with special ¼ HP motor operating the lap grinding device.
- Infinitely variable speed range from 75 to 450 feet per minute.
- Pulsating air pump and adjustable jet at point of work.
- Automatic power work feed.
- Baffle and chute to carry chips out the back.
- Control switches and pilot lamp.
- Drawer containing tools and brazing material.
- ½ HP motor.
- Ball bearing equipment thruout.

DO-ALL EXCLUSIVE FILE BANDS WILL NOT STRETCH

FULLY PATENT PROTECTED

CONTINENTAL MACHINE SPECIALTIES, INC.

1301 So. WASHINGTON MINNEAPOLIS, MINN.

How's Business?

It's getting better right along.

A swing around the circuit discloses manufacturers of widely different products operating at a continually increasing rate.

Die shops, tool shops, machine shops, manufacturers of special machinery and equipment, production manufacturers—in every line there is improvement, and best of all the feeling is that we shall continue to gain momentum, notwithstanding the election.

One manufacturer of hydraulic control equipment is operating three shifts a day, seven days a week, and in addition is placing with contract shops three times as much machine work as he has facilities to do in his own shop.

The shortage of really skilled workers is becoming acute in some districts and new equipment is being bought to offset this through increased machine production.

It does look as though we are on the way.

Please mention TDM PROGRESS when writing advertisers.

FIRTHITE CEMENTED CARBIDE TOOLS

We Design and Fabricate All Types: Standard, Semi-Standard, Special and Particular.

ALL TOOLS FINISH-GROUND ON DIAMOND WHEELS

Copper Brazing Service • *Prompt Delivery* • *Standard Tips in Stock*

LYONS MACHINE COMPANY

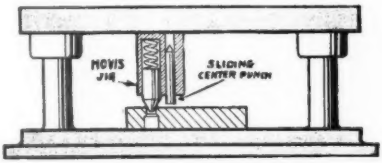
5601 TILLMAN AVE. WOodbine 2440 CLEVELAND, OHIO

"Cut and Try" Method Obsolete

THE new Hovis Jig is an ingenious little tool which cuts the time required for setting punch retainers just about in half. The average retainer requires about two hours setting time — the Hovis Jig is said to reduce it to less than one hour.

The illustration herewith shows the method. The piercing die section or button die is mounted on the die shoe, the punch holder is placed in position on the guide pins, and if possible, the die is mounted in a tryout or screw press. The face of the punch holder is then advanced to about three inches from the steel section and the Hovis Jig is placed in position with the taper spring plug in the piercing hole, then the punch holder is advanced until it bears on the face of the jig.

By revolving the jig until its position corresponds with the desired position of the retainer, then advancing the punch holder until it bottoms on the jig, the center punch will mark the exact position for drilling the screw hole.



The Hovis Jig entirely eliminates the clamping of each individual retainer to the punch holder and the usual "cut and try" method of putting the retainer into position to spot the screw hole.

The Jig is inexpensive and may be obtained from the Hovis Screwlock Company, 3129 East Larned Street, Detroit, Michigan.

Does Fast Work in Close Places

Here is our No. 213-5 Hercules pneumatic Pencil Grinder, speeded at 15,000 r. p. m. Weighs only 3½ lbs. Uses small emery pencils, wheels and rotary files. Gets into the tight places for touching up dies and moulds; is free from vibration; extremely easy to handle. . . . Additional information gladly supplied. Engineering counsel, at no charge, on request.

THE BUCKEYE PORTABLE TOOL CO. DAYTON, OHIO — HERCULES

Don't Take the Chance..

BE CERTAIN

USE ABSOLUTELY ACCURATE

TEMPERATURE INDICATING INSTRUMENTS

"ALNOR" PYROMETERS

Our 35 years experience enable us to manufacture and sell a better pyrometer at a lower price — actually for as little as $13.00. Write for catalog.

For every temperature service consult

ILLINOIS TESTING LABORATORIES, Inc.

421 N. La Salle St. Chicago, Ill.

Mauser Toolmaker's Caliper *with micrometer adjustment.*

A masterpiece of fine toolmaking. . . . Guaranteed accurate measurements to .001".

This and other types, with or without height gauge attachment, also knife-edge straight edges with insulation holder, can be furnished promptly from stock at attractive prices.

Write for our free 12-page catalog today.

GEORGE SCHERR COMPANY
124 Lafayette Street, New York, N. Y.

Should Tool, Die and Machine Shops Be Graded According to Quality of Products?

(Continued from page 5)

is to be made of the tool, die, jig, or fixture described thereon. Those degrees of tolerance can well be the justification for different estimates. Accuracy within .002 inch is certainly easier and less expensive to accomplish than accuracy within .0002. Care in specifying and emphasizing the lesser accuracy required in the first instance will bring a lower price and should, but the second circumstance should carry with it a willingness on the part of the buyer to pay the price that is necessary to obtain the greater accuracy in the product. It sometimes appears that a buyer expects a product to be finished to a .0002 tolerance but that it be priced on the basis of a .002 tolerance. The injustice of this is so evident that further comment is hardly necessary.

A "first quality" shop cannot do careless or mediocre work, and likewise a shop with inadequate facilities, employing workmen of only average ability, operating under inefficient supervision, cannot turn out a "first quality" job.

The size of the shop is not the determining factor, there being many small contract or job shops whose equipment is unexcelled and whose management is extremely capable. Much depends upon the individual tool or die maker. He "is essentially a craftsman—something of a sculptor in metal—producing articles which in most instances have not been and will not be duplicated." Such highly skilled craftsmen seek work in the shop where their employment is steady. This is invariably that shop which, by virtue of adequate prices received for its products, is able to assure delivery of a tool, die or machine which will satisfactorily perform the function for which it is intended.

But an additional fact stands out—when an order for a tool requiring especially accurate workmanship is placed with a shop which either is not qualified or equipped to do such accurate work or is not properly informed that such close tolerance is essential, then the buyer may expect to receive a tool which he cannot use. He is then confronted with

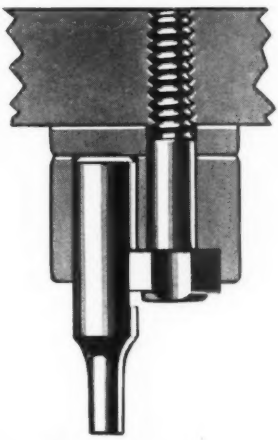
(Concluded on page 14)

Doall Develops New Power Work Feed

A POWER work feed, said to be particularly adaptable to precision sawing requirements, is now furnished with the Continental Doall Machine. The power or pressure is delivered through an ingenious application of a spring motor. A heavy coil spring power unit is built into the base of the machine. (Super-imposed on the illustration is one of these power units to show its relative size and the approximate position where it is built into the cabinet.) The spring motor delivers a constant pressure of 50 pounds. However, the "pull" is controlled by a foot pedal to permit a regulation of cutting pressure, or an instantaneous release of the pressure, while both hands are free to guide the work. The noose which grips the work is welded chain that may be unhooked readily. It is said that the technique of using narrow blade saws requires a carefully controlled pressure feed for the most efficient operation.

HOVIS SCREWLOCK RETAINER

for punches and button dies



Quickest Change—No Wedge or Key Parts.

Straight Thrust and Pull—No Sidestrain.

Strongest, Most Scientific Construction—piercing pressure against hardened steel back plate — stripping strain against heat-treated alloy steel screw.

Present punches can readily be salvaged.

Multiple Plates of any size or number of punches made in ONE PIECE.

Our prices are lower.
Let us quote.

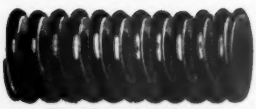
HOVIS SCREWLOCK CO.
3129 East Larned St.
DETROIT, MICHIGAN

TRYING TO LOCATE THAT "SQUEAKY" SPRING

You can't hear a die spring

Possibly not, but inferior to their job—fairly SHR BREAK. The resulting los

HOW TO SECURE LONGER DIE



Flat Rounded Spring

Select your die springs from the chart in your Danly Catalog. You'll find exactly the "Standard" or the "Special" springs that your work demands. Danly Die Springs *last longer*. They are made of Silico-Manganese Steel, carefully heat treated and hardened after coiling. They are made Flat-Rounded or Square for Pressure-Pad, Knock-Out and Stripper Plate service . . . And when you order Danly Die Springs, remember t . . . Dowel Stripper b quality De branches to

See your requirem

DANLY DIE SETS AND D

e spring "squeak," you say?

inferior springs — or springs not adapted
y SHRIEK from fatigue. Shortly they
ting lost time is costly — and unnecessary.

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remember that Danly Guide Posts . . . Bushings . . . Clamps . . . Dowel Pins . . . Socket Head Cap and Set Screws . . . Stripper Bolts and Precision and Commercial Die Sets are quality Die Makers' Supplies, too. They are stocked in all branches for immediate delivery.

See your Danly Catalog for prices and discounts or send your requirements to the nearest Danly branch office plant.

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Socket Head Set Screws

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Socket Head Cap Screws

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TOOL DIE MACHINE
PROGRESS

Official publication of the
SPECIAL TOOL, DIE AND MACHINE SHOP INDUSTRY
3500 Members in the U.S.A.

Please send contributions to
GEORGE J. HUEBNER, *Secretary*
Special Tool, Die and Machine Shop Institute
P. O. Box 3561, Cleveland, Ohio

Vol. II, No. 4 June, 1936

Should Tool, Die and Machine Shops Be Graded According to Quality of Products?

(Continued from page 10)

the necessity for having the tool remade or a new one made. In either case, there is *delay*—time lost—and if time is money (and it certainly is in production) then the chances are that that delay actually represents a greater cash outlay by far than there would have been if the specifications for the tool had been absolutely accurate in the first instance and the order had been placed with the shop known to be equipped and qualified to turn out the product with the degree of accuracy required. It has been proven many times that in such circumstances the high dollar paid for such a tool or die or machine represents a distinct saving.

The shops of the Industry vary considerably in size, from a few men to a thousand. In some instances the larger units will manufacture standard or semi-standard equipment. But generally members of the Industry are equipped to manufacture the numerous specially designed tools, dies, jigs, fixtures, molds, gages, machines or other special products which other industries call upon them to make and frequently to design and develop. There are exceptions, of course, notably the shops which specialize in general maintenance and repairs.

The design and development of Special Machinery is a major function of many TDM Industry members. Throughout the highly developed industrial area from New England to the Great Lakes, and in fact clear across the country to the Pacific Coast—and sometimes from the most unexpected smaller towns—may come information about a new and interesting machine. Only one may be made because only one producer has use for it in the manufacture of his product, but again that one machine may be the forerunner of dozens and hundreds adapted to the needs of other manufacturers in the same or other industries.

Recently a member of the Industry, by giving publicity in PROGRESS to a machine designed, developed and manufactured for one large production manufacturer, was called upon to study the needs of another and submit suggestions for equipment to be developed—an assignment which may exceed $20,000. Within the last few days, word has reached us of an inquiry received by a member of this Industry for a machine which PROGRESS described, and in this instance the order would amount to some $5000.

These two instances are cited not to show the effectiveness of PROGRESS as an advertising medium, but the unique opportunity for production manufacturers to avail themselves of the engineering and manufacturing facilities of TDM shops.

We would pass on to customers and prospective customers of the Industry just one suggestion: Buy your production tooling equipment—your tools, dies, jigs, fixtures, molds, gages and machines—not on a *price basis* but upon the truly time-tested basis of ultimate production cost. If a tool is never to be used after it has turned out 5000 pieces of a given product then let it be built and priced from that standpoint, but if it is to turn out 100,000 or a million pieces, then have your tooling equipment or machine designed and built to do that job.

THANKS, MR. PRESIDENT!

"The May issue of PROGRESS has come to hand and I have read it from cover to cover with admiration and pride. You are to be congratulated and I earnestly hope that the development of this little publication will prove to be a means of strengthening our Industry."

FREDERICK S. BLACKALL, JR.
President and Treasurer,
The Taft-Peirce Manufacturing Company

Mr. Blackall is President of the Special Tool, Die & Machine Shop Institute.—Ed.

He Measures In Millionths

(Continued from page 4)

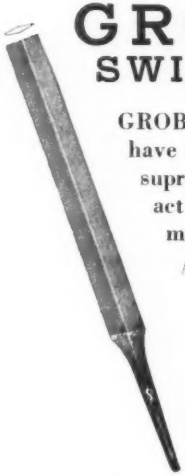
marvelous star—Edison! He gave all humanity a constant, dependable efficient light. He showed the world how to distribute electricity for a thousand uses in home, factory and office. He devised a machine that registered and then resounded the human voice. He invented motion pictures. He put electricity to work in the chemical world in literally thousands of different uses. And from each of these inventions, great new industries sprang into being. He, too, changed the face of the Earth.

The population of the Civilized world had been increasing steadily. On the heels of invention came a tide of human needs such as the world had never known before. In all branches of industry in which the product is used by the individual the demand began to be numbered in millions. Millions of persons wanted electric lights, phonographs, telephones, tools, typewriters, toys, sewing machines, skates, guns, bicycles, watches, cameras, musical instruments, electric heaters, curlers, toasters and other equipment. A new urge had touched the blood of humanity—speed, volume, mass-movement. The world began to hear about "division of labor," about "mass production."

But there was a bar that blocked the way. In a great many of the manufactured articles, even in the crude form of their first presentation to the public, again smaller and more accurate measurements were required. Man already had equipment to do this slowly—but to do it rapidly was, as yet, out of the question. Then, as competition led to greater and greater refinement of all manufactured products, the problem of fine measurements steadily increased to one of the first magnitude. There came a time when world industry was being throttled by lack of some quick method for making a measurement so fine as one one-thousandth of an inch.

One day a youth in a little Swedish town, harassed by the delays in the work of his lathe, determined to solve that problem. He had caught an idea of how it might be done. With the patience and earnestness worthy of some old master he persevered against all delays, disappointments and handicaps; all obstacles, all discouragements. And after

(Continued on page 16)



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CLEVELAND

Please mention TDM PROGRESS when writing advertisers.

He Measures In Millionths

(Continued from page 15)

years, he succeeded. Today in thousands of industrial plants scattered over the Earth workmen can make, in almost the twinkling of an eye, a measurement as fine as two one-millionths of an inch! In the long progress of man's advance, the Swedish youth, also, did his part, in his time, to change the face of the Earth.

For he evolved one of the basic factors that make modern refined mass production possible. Before he fashioned his gages the world had fine watches, automobiles, machines and instruments. But it had them only in thousands; it required too long to manufacture them. Today the world has them in scores of millions.

The story of that achievement is the story of the Johansson Gage Blocks, the world's standard of measurement. When the first set of blocks was made it was accurate within one ten-thousandths of an inch. Later the accuracy was increased to fifty-millionths inch, then ten-millionths inch. Shortly after the Ford Motor Company acquired the gage blocks this accuracy was increased to eight, four and finally two millionths of an inch. The Ford automobile, for example, has 186 points of contact in which tolerances of less than five 10,000th of an inch are required. Today's Ford car could not have been built in volume 25 years ago.

That the average person, unused to the ways of the laboratory and the tool-room, may see clearly the function of the Johansson gages and their stupendous

(Continued on page 22)

Proof OF THE **PUDDING** IS IN THE EATING . . .
PROOF OF THE **ADVERTISING** IS IN THE INQUIRIES . . .

THE SOMMER & ADAMS COMPANY
DESIGNERS & MANUFACTURERS OF
SPECIAL MACHINES TOOLS JIGS AND FIXTURES
FACTORY AND GENERAL OFFICE 10511 BELLE AVENUE
CLEVELAND, O.

June 18, 1936

Mr. George J. Huebner, Editor
Tool·Die·Machine·PROGRESS Magazine
Cleveland, Ohio

Dear Mr. Huebner:

It is always a satisfaction for a man to be told that he is making progress, and consequently I am certain that you will be glad to know about inquiries which we have received as the result of two advertisements in PROGRESS, our industry's publication.

Our first advertisement appeared in the April issue and as a result we received an inquiry for a machine similar to the one we illustrated, which we hope to convert into a sale of very substantial proportions.

The May issue brought us an inquiry on a Continuous Milling Machine, designed and manufactured by our company, and this also holds possibilities of developing into a substantial account.

I was glad to note the increased amount of advertising which PROGRESS carried last month, and I also commend you upon the interesting articles which you have been able to obtain.

You have my best wishes for your continued success.

Very truly yours,
THE SOMMER & ADAMS COMPANY
L.A. Sommer
President

LAS/N

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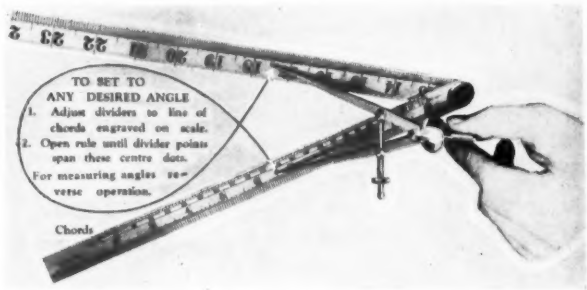
Write

George J. Huebner, Sec'y
Special Tool, Die and Machine Shop Institute
Box 3561 Cleveland, Ohio

Please mention TDM PROGRESS when writing advertisers.

A New, Handy Instrument for Shop-men

SHOP-MEN as well as engineers, draftsmen and lay-out men will welcome a very simple and exceedingly inexpensive new measuring and lay-out instrument.


TO SET TO
ANY DESIRED ANGLE
1. Adjust dividers to line of chords engraved on scale.
2. Open rule until divider points span these centre dots.
For measuring angles reverse operation.
Chords

It is a jointed steel rule, made of stainless steel, which also serves as a protractor and can be set quickly and accurately to any desired angle.

There is a line of chords engraved on one side of the rule from 0° to 120°, advancing by half degrees, and the rule is provided with two center dots, as shown in the illustration, one on each blade, by which, with the aid of a pair of dividers, the rule can be set to any desired angle, or vice versa, any angle can be determined. The joint is provided with a spring tension which supplies sufficient friction to hold the angle setting rigid for scribing and lay-out work.

A check with a conventional protractor will show that the setting of this combination rule and protractor is of great accuracy.

This new precision instrument is made by Chesterman and sold by the George Scherr Company, 124 Lafayette Street, New York.

The price is less than $2.00 and its practicality is so assured that the trade may have the instrument on ten days free trial.

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Ask how we lock the Knurled "Unbrako" when countersunk—it's unique.

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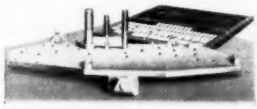
CLEVELAND, OHIO

He Measures In Millionths

(Continued from page 16)

significance to humanity, let us consider, for a moment two of the basic requirements to be met, apart from the exceedingly delicate and difficult task of the actual making of the blocks.

The Ford Motor Company is an excellent example of an industry manufacturing a product for world distribution. Cars and parts made at Dearborn and other points in the United States and England are used in all parts of the world. There are wide variations in temperature between the place of manufacture and the place of use. This makes a serious problem for the manufacturer. Most people know that heat expands metals. In the laying of railroad track, for example, a small space is left between rails because, were no such space left for expansion, the rails, lengthening slightly under the summers sun, would "buckle" and tear loose from the ties. The automobile manufacturer must take account of this phenomena—otherwise parts made in northern temperatures would not fit in the tropics and vice versa. So, for years the automobile manufacturer could not build motors of extremely fine adjustments—a certain amount of "play" or "tolerance" had to be left in pistons, connecting rods and



Johannson Gage Blocks in use for checking holes in relation to each other in drill jig.

other points of friction to allow for this expansion due to heat.

This formed Johansson's first problem.

How Johannson solved this problem of varying world temperatures, how he obtained acceptance of an international measurement factor, achieved a metal in which warping or "growing" is checked and finally perfected "Jo Blocks" as they are affectionately designated by thousands who depend upon them for super-accurate measurement are told in TDM PROGRESS for July.

(To be concluded in July issue)

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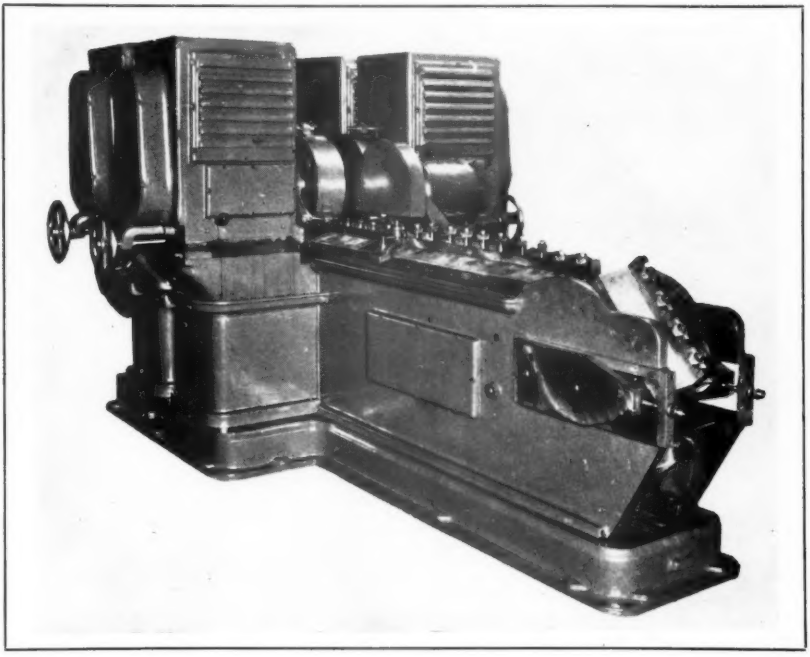

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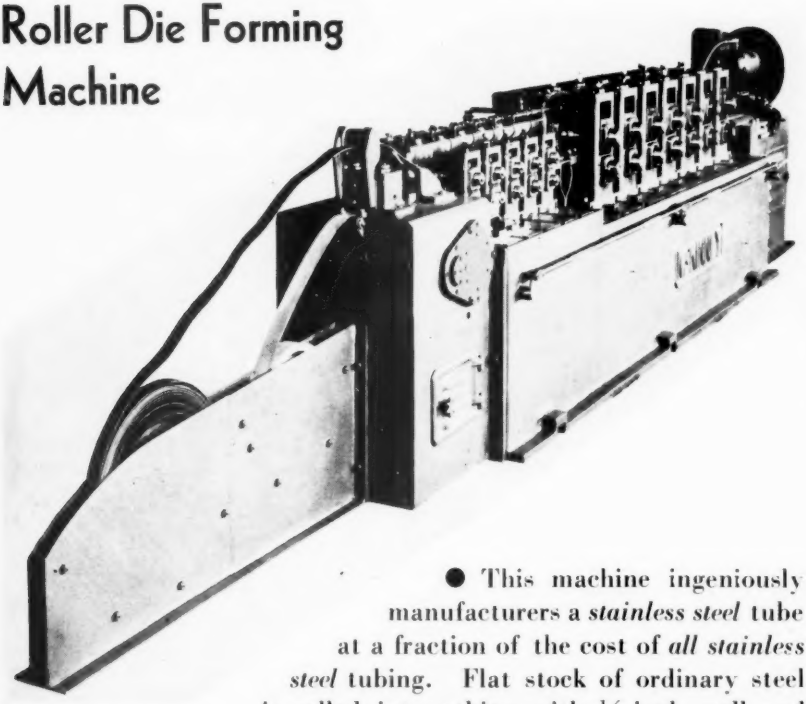

● This machine ingeniously manufacturers a *stainless steel* tube at a fraction of the cost of *all stainless steel* tubing. Flat stock of ordinary steel is rolled into tubing with ⅛ inch wall and covered with stainless steel 0.015 inch thick.

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